Nursing and Health Sciences (2013), **15**, 51–57

Research Article

Improvement of Iranian nurses' competence through professional portfolio: A quasi-experimental study

Masoud Bahreini, PhD,[1] Marzieh Moattari, PhD,[3] Shohreh Shahamat, MSc,[4] Sina Dobaradaran, PhD[2] and Mariam Ravanipour, PhD[1]

[1]*Faculty of Nursing,* [2]*Faculty of Health, Bushehr University of Medical Sciences, Bushehr,* [3]*Faculty of Nursing, Siraz University of Medical Sciences, Siraz, and* [4]*Organizational Psychology, Marvdasht branch, Islamic Azad University, Marvdasht, Iran*

Abstract The aim of the study was to determine the effect of a portfolio-based professional development program on nurses' competence in a university hospital in Iran. A pre-test/post-test, controlled, quasi-experimental design was used. From the university hospital's 18 general wards, four wards were randomly selected. Two wards were randomly allocated as the experimental group (35 subjects) and two wards as the control group (38 subjects). Nurses in the experimental group participated in a 12-month portfolio-based professional development program and nurses in the control group participated in the routine professional development programs of their wards. The data were collected by the Nurse Competence Scale and were analyzed using descriptive statistics and independent and paired *t*-tests. After intervention, the average nurses' competence in the experimental group increased significantly ($P < 0.001$) but these changes in the control group were not significant ($P = 0.08$). This study shows that the professional portfolio is an effective tool for improving nurses' competence. The professional portfolios help nurses update their knowledge, skills, and competence towards their full role as nurses.

Key words competence, Iran, nursing, portfolio, professional development.

INTRODUCTION

The nursing profession, like so many others, is increasing its emphasis on promoting continuing competence of its members. Also, rapidly changing healthcare environments, technology and related demands require increasing competence of nurses at all levels and in all settings. Continuing competence, therefore, is an important topic for attention, decisions, and planned implementation. Of course, the definition of competence lacks consensus, remains obscure, and is contradictory (Yanhua & Watson, 2011), however, a holistic conception of competence has been accepted by many researchers (Black *et al*., 2008). According to the holistic definition of competence, the Iranian Nursing Organization (INO, 2010) applied the term competence as referring to "a combination of skills, knowledge, attitudes, values and abilities that underpin effective and/or superior performance in a professional/occupational area." In this study, competence is defined in terms of capacity to integrate knowledge, skills, attitude, and values in specific contextual situations of practice (Cowan *et al*., 2007).

On the other hand, nurses have reported that they have experienced a theory–practice gap in clinical practice in which theory does not correspond to their clinical practice (Cheraghi *et al*., 2007). A nurse's chance of incorporating practical and theoretical knowledge is reduced after entering clinical practice and gradually, by added experiences, nurses will be further distanced from their past practical knowledge (Liang, 2007). This gap has adverse consequences. Researchers in developed countries like the United States and the Netherlands have estimated that only between 30% and 45% of patients receive care that is based on scientific evidence, and that 20–25% of the care provided is unnecessary and also potentially harmful (Asch *et al*., 2006).

To address this challenge, using portfolios in nursing is being considered by regulatory bodies. The 1998 Pew Health Professions Commission report criticized the state regulation of health professionals (Trossman, 1999). According to Trossman (1999), professionals should be required to document competency in order to protect the public. The National Council of State Boards of Nursing (NCSBN) is now considering a proposal for America's 2.6 million nurses to create and maintain a professional portfolio known as the "Continued Competency Accountability Profile" (CCAP) (Trossman, 1999).

Professions, such as architects, engineers, and graphic artists, have long used portfolios as authentic evidence of

Correspondence address: Shohre Shahamat, Organizational Psychology, Marvdasht branch, Islamic Azad University, Marvdasht, Iran. Email: mbahreini@sums.ac.ir

Received 14 October 2011; revision received 2 July 2012; accepted 18 July 2012.

doi: 10.1111/j.1442-2018.2012.00733.x

their professional accomplishments. As such, a professional portfolio is a comprehensive document that demonstrates their professional accomplishments. More recently, both nationally and internationally, nurses have used professional portfolios to document their professional competence (Kear & Bear, 2007). The word is derived from the Latin "*portare*", which means "to carry", and "*foglio*", which means "leaf or sheet." McMullan (2008) stated that a portfolio is a collection of evidence of both the products and process of learning that attests to achievement and personal and professional development.

In nursing, a portfolio is frequently utilized as an approach for both formative and summative assessment of nursing students (McMullan, 2008) and to record ongoing personal and professional development for qualified nurses in many countries (McMullan *et al*., 2003). For personal and professional development, portfolios can improve nurses' abilities to integrate theory with practice; improve in knowledge and understanding, increase awareness of the nurses' own strengths and weaknesses and engage in reflection and lifelong learning (Buckley *et al*., 2010). Also Byrne *et al*. (2007) believe that portfolios promote competence through critical thinking, self-assessment, and individual accountability. The United Kingdom Central Council (UKCC) (2001) further encouraged the development of work-based portfolios by registered nurses as a way of improving patient care and developing professional competence.

The theoretical principles of portfolios are based on the assumption of adult learning principles that include: (i) the learner is self-leading; (ii) resource-rich experiences of the learner are considered as rich resources of learning; and (iii) learners are self-motivated for their own growth and success (Kolb, 1984).

Mills (2009) believes that nurses may use three main types of portfolios: learning, evaluating, and presenting. She believes that a professional portfolio is a combination of learning and presentation portfolios, the main purpose of which is to display adequate skills and qualifications to receive a degree. Electronic portfolios are becoming more popular as information technologies and becoming more a part of everyday life. Some of the benefits of an electronic portfolio over a paper-based version are that they demonstrate technological knowledge and skills, facilitate distribution, improve portability, and provide avenues for creativity beyond pen and paper by using video, podcasts, and audio recordings.

At present in Iran, portfolios are neither used in nursing educational programs at the undergraduate and the graduate levels nor in continuing education programs in hospitals. Portfolios are used only at the doctoral level on a very limited basis. As such, practicing nurses and nursing students are not able to take advantage of this tool. Moreover, there has been little research conducted so far about the use of portfolios by practicing nurses and nursing students.

LITERATURE REVIEW

A review of studies in developed countries has shown the increasing use of portfolios in nursing (Patrick-Williams & Bennett, 2010; Ryan, 2011). Results of these studies indicated that portfolios encouraged reflection, facilitated engagement with learning, and increased personal responsibility (Byrne *et al*., 2007; Tochel *et al*., 2009). Also results of the study of Cooke *et al*. (2009) revealed that the portfolio provided a framework for students to initiate and support their clinical learning in partnership with clinicians. Cooke *et al*. (2010) in a questionnaire study conducted in Brisbane, Australia, evaluated the utility of the Clinical Progression Portfolio to enable nursing students to learn how to initiate engagement with their RNs and to develop their capacity as students to learn. Overall, students reported that the portfolio was a useful learning and communication tool as it provided them direction in how they might maximize opportunities to address their learning needs. However, most of the studies in this area have been conducted on nursing students with less focus on practicing nurses. In the United States, Hespenheide *et al*. (2011) used the portfolio as a tool to demonstrate professional development of advanced practice registered nurses. Feedback from nurses involved in the study supports portfolio as a meaningful method to foster ongoing professional growth and development. In New Zealand, Jones (2010) used a professional portfolio as an assessment tool. In an action research study, she investigated the development and implementation of a portfolio for the assessment of practice in a professional development program. Findings indicated that a portfolio may support quality learning, the promotion of self assessment, autonomy and meta-cognition. In addition, McColgam (2008) after her structured search of the literature was undertaken on the subject of portfolio building and registered nurses concluded that portfolios work effectively for developing competence.

It should be noted that the results of the studies regarding the outcomes of portfolios applicability have not been always positive. Williams *et al*. (2008) studied on 461 nursing students and their lecturers in Great Britain. The results of their study indicated that there were significant discrepancies between the lecturers and student nurses in their views on how portfolios were used. Brennan and Lennie (2010), who also investigated students' perceptions of the use and effectiveness of portfolio based learning in the United Kingdom, concluded that completing the portfolio was time consuming because a majority of students had acknowledged the excessive amount of paperwork involved in this regard.

In Iran, there is no record of practicing nurses' portfolio-related studies; and the studies conducted on nurses' students are very limited in this regard. Valizadeh *et al*. (2011) in a quasi-experimental study conducted at a nursing school in Iran assessed the effect of clinical education and assessment through portfolio on cognitive learning of nursing students in clinical settings. Results indicated that Portfolio significantly enhanced the cognitive learning of nursing students. Saltman *et al*. (2010) believe that the current scientific evidence about the effects of portfolios is very limited and that more studies are necessary to strengthen the scientific evidence for using portfolios.

Aim

The aim of the study was to determine the effect of a professional portfolio on the clinical competence of nurses working in a university-based teaching hospital.

METHODS

A pre-test/post-test control group design was performed in this quasi-experimental study, which was conducted in 2011.

Setting and participants

The setting was a teaching hospital affiliated with Bushehr University of Medical Sciences in southern Iran, which offers specialty and subspecialty medical services for the patients of the southern area of the country. The hospital has 350 beds, 23 wards, and 300 nurses.

From 18 general wards of the hospital, four wards were randomly selected. These wards were similar in terms of the numbers and types of patient presentations seen. Two wards were randomly allocated as the experimental group and two wards as the control group. A flip of a coin determined whether wards went to the experimental group or the control group. All registered nurses employed in these wards ($n = 105$) were invited to participate. A total of 73 staff nurses (69.5%) participated in the study. The most important reasons for the refusal of nurses to participate in this research was lack of time to comply with research regulations. It is difficult to recruit participants for experimental studies because they often require a commitment to long-term follow-up (Patel *et al*., 2003).

The sample size was calculated based on the previous study (Dehghani *et al*., 2011), significance level of 0.05, a power of 0.90 and $d = 10$. The effect size, "d" is computed by dividing the differences in the means between the groups by the standard deviation. We needed at least 25 participants in each group to detect a large standardized effect in our primary outcomes. To compensate for unassessable participants, 73 nurses were enrolled and agreed to participate. The experimental group consisted of 35 nurses from two wards, while 38 nurses from two other wards composed the control group. The inclusion criteria were: (i) graduation from the BSc nursing program; (ii) working full-time in this university hospital as a nurse; and (iii) a willingness to participate in the study. Exclusion criteria included: (i) unwillingness to continue participation in the study; and (ii) change of duty from the control group wards to the experimental group wards and vice versa.

Ethical considerations

The Research Ethics Committee of the Bushehr University of Medical Sciences approved the study and it was conducted in coordination with the hospital's nursing department. The objectives and the implementation methods for the study were explained to the nurses. The participation in the study was voluntary and written informed consent was obtained from all participants.

Intervention

Workshops were held by the research team at the first step of intervention to describe portfolios and structured reflection on action. Subjects of the experimental group were divided into two groups and each group attended a similar 16 h (2 days) workshop. Members of the trainer team had a PhD in nurse education and were faculty members of the university.

Our portfolio takes the form of a ring binder which allows material to be removed or added as the individual chooses. Each Portfolio contained special sections in order to collect evidence and documentation regarding continuous learning, personal résumés, professional training, self-assessment, and structured reflection (Johns, 1995). The nurses were given practical training in the workshops to be able to complete the portfolios, and during teamwork activities they practiced the structured reflection.

After participation in workshops, nurses in the experimental groups implemented the portfolio-based approach in their clinical practice for 12 months – March 2010–2011. The nurses identified their learning requirements during the completing of the portfolios and reflected on their own clinical experiences. They then presented written descriptions of their clinical experiences, the main influencing factors in their clinical experience, and the handling of these factors through reflection. The comparison of the nurses' current clinical practice with the standard conventional practice and its educational effects on nurses' practice, when faced with similar situations in the future, was the major principle in this reflection on action, which was obtained through studying scientific literature related to clinical experiences and their structural analysis. The nurses' portfolios were collected at the end of each month and returned to them after being studied by the principal researcher who provided written feedback. The control group nurses participated only in their routine departmental training programs. These routine in-service training programs include participation in long- and short-term training programs such as participation at congress, conferences, workshops, scientific meetings, and courses. The post-test was performed at the last step of intervention.

Data collection

Nurses' competence levels were assessed at the beginning as well as the end of the study for both the experimental and the control groups. The criteria for assessing and comparing the clinical competence of nurses in the two groups were based on the pre-test and post-test scores of the averages of nurses' self-assessment and the assessment made by their head nurses.

The data collection instrument was the Nurses Competence Scale (NCS). The scale, which was developed by Meretoja *et al*. (2004), consists of 73 nursing skills organized into seven competence categories: the helping role (7 skills); teaching–coaching (16 skills); diagnostic functions (7 skills); managing situations (8 skills); therapeutic interventions (10 skills); quality assurance (6 skills); and organizational roles (19 skills). The level of nurse competence is measured

with a Visual Analogue Scale (0–100). Demographic variables included gender, age, marriage, education, and both current and total working experience. Items of NCS and steps of psychometric tests of this scale, including translation, reverse translation, pilot study, content validity, and reliability, have been published previously (Bahreini *et al.*, 2011). Internal consistency among the seven categories varied between 0.76 and 0.85.

Data analysis

The data were analyzed using SPSS 16 (SPSS, Chicago, IL, USA). Mean, percentages, and frequency were used for data description. A *t*-test was used for between-groups comparisons and a paired *t*-test was used for within-groups comparisons. Statistical significance was set at $P < 0.05$.

RESULTS

The experimental group comprised 33 female nurses (94%), and 2 male nurses (6%). The control group consisted of 37 female nurses (97.5%) and 1 male nurse (2.5%). All participants had bachelor degrees in nursing. The two groups showed insignificant differences on the bases of the Pearson's chi-squared test and were matched for these nominal variables. There were no significant differences in age, current work experience, and total work experiences between both the groups ($P > 0.05$) (Table 1).

The nurses' overall competence scores and scores in the seven categories of competence between the experimental group and the control group were compared before the intervention, and the differences were insignificant based on an independent *t*-test ($P > 0.05$). This comparison of scores showed that the nurses in the two groups had similar levels of competence before the intervention.

Comparison of the nurses' mean competence scores in the experimental group before and after the intervention showed significant improvement in overall level of competence and their competence in the seven categories ($P < 0.001$) (Table 2). Comparison of the changes from the pre-test to post- test scores within the control group showed that there were significant improvement of the nurses' competence scores only in the category of quality assurance ($P = 0.02$). In the other categories, and in overall competence, the differences were insignificant ($P > 0.05$) (Table 3). There were significant differences in competence scores between experimental and control groups at post-test in all categories (Table 4).

DISCUSSION

The purpose of this study was to determine the impact of professional portfolios on the clinical competence of nurses. Comparison of changes in the experimental group before and after the intervention has shown significant differences in the levels of nurses' clinical competence scores. In the control group, the differences in clinical competence mean scores before and after the intervention were insignificant. These results indicate that application of portfolios has a more positive impact on clinical competence than the conventional programs of continuing professional development and is consistent with other research performed in this area worldwide. For example, the results of the studies showed that reflection and completion of portfolio strengthen the critical approach in nurses' performance and foster ongoing professional development (Driessen *et al.*, 2005; Hespenheide *et al.*, 2011). Tochel *et al.* (2009) have also pointed out the efficiency of portfolios in promoting professional development. In their explanation on portfolio effectiveness, the researchers believe that the major effect is caused by assisting nurses to

Table 1. Comparison of demographic variables in experimental and control groups

Variable	Experimental group	Control group	*P*-value
Age (years)	32.26 ± 6.81	31.14 ± 7.12	0.59
Total nursing experiences (years)	7.76 ± 6.61	7.10 ± 6.90	0.71
Current ward experiences (years)	4.15 ± 4.25	3.76 ± 4.42	0.44

Table 2. Comparison of nurses' competence scores before and after intervention (experimental group)

Category of competence	Pre-test (mean ± SD)	Post-test (mean ± SD)	*t*-value	*P*-value
Helping role	77.69 ± 6.15	89.35 ± 4.42	–8.12	< 0.001
Teaching–coaching	76.84 ± 7.14	88.67 ± 4.29	–5.91	< 0.001
Diagnostic functions	76.09 ± 9.36	87.69 ± 5.89	–4.59	< 0.001
Management situations	78.10 ± 10.11	89.42 ± 6.33	–4.72	< 0.001
Therapeutic interventions	76.49 ± 8.40	87.69 ± 6.89	–5.12	< 0.001
Quality assurance	63.88 ± 5.50	84.12 ± 8.71	–9.23	< 0.001
Work role	76.94 ± 6.71	89.85 ± 4.20	–6.59	< 0.001
Total competence	75.68 ± 6.35	85.70 ± 6.37	–6.03	< 0.001

Table 3. Comparison of nurses' competence scores before and after intervention (Control group)

Category of competence	Pre-test (mean ± SD)	Post-test (mean ± SD)	*t*-value	*P*-value
Helping role	79.57 ± 9.82	81.58 ± 6.42	1.17	$P = 0.26$
Teaching–coaching	79.02 ± 9.01	81.15 ± 8.11	1.61	$P = 0.13$
Diagnostic functions	79.32 ± 9.58	80.11 ± 8.13	3.25	$P = 0.13$
Management situations	82.58 ± 11.40	83.49 ± 6.88	2.02	$P = 0.16$
Therapeutic interventions	78.29 ± 9.29	79.69 ± 6.86	1.67	$P = 0.12$
Quality assurance	64.19 ± 7.19	76.32 ± 8.12	–2.51	$P = 0.02$
Work role	80.58 ± 10.19	81.79 ± 7.15	2.27	$P = 0.28$
Total competence	77.64 ± 10.11	81.01 ± 7.11	1.12	$P = 0.08$

Table 4. Comparison of nurses' competence scores after intervention (between exp. Group and cont. group)

Category of competence	Experimental group (mean ± SD)	Control group (mean ± SD)	*t*-value	*P*-value
Helping role	89.35 ± 4.42	81.58 ± 6.42	–3.08	< 0.05
Teaching–coaching	88.67 ± 4.29	81.15 ± 8.11	–3.15	< 0.05
Diagnostic functions	87.69 ± 5.89	80.11 ± 8.13	–2.61	< 0.05
Management situations	89.42 ± 6.33	83.49 ± 6.88	–2.07	< 0.05
Therapeutic interventions	87.69 ± 6.89	79.69 ± 6.86	–2.65	< 0.01
Quality assurance	84.12 ± 8.71	76.32 ± 8.12	–2.38	< 0.05
Work role	89.85 ± 4.20	81.79 ± 7.15	–3.97	< 0.01
Total competence	85.70 ± 6.37	81.01 ± 7.11	–3.34	< 0.05

reflect on their performance (Rees & Sheard, 2004). Reflection helps the nurses to review their past performance, analyze it, and consider alternatives (Jones, 2010). It seems that in addition to the unique role of reflection as the main section of the portfolio, and because learning in the portfolio occurs based on the individual learning needs, the nurses' competence promotion level is completely purposeful and based on their professional learning requirements.

In the current study, in addition to the positive and significant impact of the portfolio on overall clinical competence of nurses, significant changes have also been observed in the nurses' competence in the seven categories. Improvement of clinical competence in the categories of quality assurance, managing situations, and organizational roles are some of the outcomes. Timmins and Dunne (2009) in their study have confirmed that portfolios can help nurses improve their skills in their respective categories. Developing a sense of responsibility, identifying learning and skills requirements, promoting critical thinking, improving confidence and clinical decision making, were included in Timmins and Dunne (2009) study, which were also pointed out by the nurses as the reasons for improving their clinical competence in specific categories. In an action research study by Jones (2010), the influence of a professional portfolio on the quality of learning in the vocational training programs was understood and the ways through which the portfolio could improve the quality of learning were determined. These were the integration of theoretical knowledge and professional practice, promotion of self-assessment, autonomy, reflection, and self-recognition.

Certainly there are different and sometimes conflicting results observed in these studies. In a cross-sectional study by McMullan (2008), which explored nursing students' views on the application of a portfolio with respect to learning and assessment, it was observed that the nursing students participating in the study believed that portfolios had failed to reduce the gap between theory and practice. Schaffer *et al*. (2005) also mentioned similar results in their study.

Williams *et al*. (2008) compared perceptions of portfolios between student nurses at the early and latter stages of their training. The results of their study indicated that the value of portfolios becomes less salient to student nurses towards the end of their training. Researchers in this study, while confirming the efficiency of portfolios in nursing education, as well as in clinical nursing, have concluded that clinical mentors need to look at students' perceptions and why some nursing students' views on portfolios deteriorate. Also Hrisos *et al*. (2008) observed a contradiction in views of the trainee doctors and their supervisors using the portfolio in the clinical workplace. Although trainees considered portfolios interesting, they gave relatively less educational value to them. The educational supervisors gave more educational value to the portfolios than the trainees did. It seems difficult to interpret and analyze the trainees' attitudes towards the applicability of portfolios. On the one hand, they believe portfolios are a good idea; on the other hand, they denounce its applicability. Ironically, the result was not very positive even in the reflection stimulation, and a significant proportion of the participants considered portfolios inapplicable.

Study limitations

The research environment of this study was limited to a hospital in a particular area of the country with a limited sample size. Therefore subjects are only representative of nurses in this hospital, indicating that caution should be exercised when generalizing these results. It is certain that other studies on the same subject, in different research environments and in other hospitals in the country, could identify other strengths and weaknesses of using the portfolio approach to the professional development of nurses.

All the nurses participated in this research had no previous experience of portfolio use and portfolio use in this context was conceivably also novel for many nurses. Thus, another limitation is the possibility that our findings reflect some uncertainty associated with a novel and transitional process.

CONCLUSION

Results indicated that professional portfolios are useful tools for nurses to improve their clinical competence in all categories including helping roles, managing situations, therapeutic interventions, and professional roles. The portfolio, when used by nurses, helps update their knowledge and competence towards their full role as nurses. Therefore, nurses and nurse managers should consider using this valuable tool in actual clinical environments and pave the way for introducing new methods to provide continuing vocational education and professional development of nurses.

Further research would be useful to refine and explore the use of the portfolio to meet the competence needs of registered nurses. Further research should also be conducted in nursing schools and on nursing students to assess the efficacy of portfolios in clinical education. Assessment of nurses' perceptions and experiences in using the portfolios can be a subject for further studies. It is also recommended that hospitals and other clinical areas consider and assess the impact of the application of nurses' professional portfolios on patient satisfaction and other care processes.

ACKNOWLEDGMENTS

Much appreciation goes to the nurses participating in this study, who undertook the greatest efforts, and the Research Deputy of Bushehr University of Medical Sciences who undertook the funding of this study. The nursing management of the hospital is also appreciated.

CONTRIBUTIONS

Study Design: MB, SS, MM.
Data Collection and Analysis: MB, MM, SS.
Manuscript Writing: MB, SS, MB, SD, MR.

REFERENCES

Asch SM, Kerr EA, Keesey J *et al*. Who is at greatest risk for receiving poor-quality health care? *N. Engl. J. Med.* 2006; **354**: 1147–1156.

Bahreini M, Shahamat S, Hayatdavoudi P, Mirzaei M. Comparison of the clinical competence of nurses working in two university hospitals in Iran. *Nurs. Health Sci.* 2011; **13**: 282–288.

Black J, Allen D, Redfern L. Competencies in the context of entry-level registered nurse practice: a collaborative project in Canada. *Int. Nurs. Rev.* 2008; **55**: 171–178.

Brennan KM, Lennie SC. Student' experiences and perceptions of the use of portfolios in UK preregistration dietetic placement: a questionnaire-based study. *J. Hum. Nutr. Diet.* 2010; **23**: 133–143.

Buckley S, Coleman J, Khan KS. Evaluation: best evidence on the educational effects of undergraduate portfolios. *Clin. Teach.* 2010; **7**: 187–191.

Byrne M, Delarose T, King CA, Leske J, Sapnas KG, Schroeter K. Continued professional competence and portfolios. *J. Trauma Nurs.* 2007; **14**: 24–31.

Cheraghi MA, Salasli M, Ahmadi F. Iranian nurses' perceptions of theoretical knowledge transfer into clinical practice: a grounded theory approach. *Nurs. Health Sci.* 2007; **9**: 212–220.

Cooke M, Mitchell M, Moyle W, Henderson A, Murfield J. Application and student evaluation of a clinical progression portfolio: a pilot. *Nurse Educ. Pract.* 2010; **10**: 227–232.

Cooke M, Walker R, Creedy D, Henderson A. Clinical Progression Portfolio: a resource for enhancing learning partnerships. *Nurse Educ. Pract.* 2009; **9**: 398–402.

Cowan DT, Wilson-Barnett J, Norman IJ. A Europian survey of general nurses' self assessment of competence. *Nurs. Educ. Today* 2007; **27**: 452–458.

Dehghani Z, Abaszadeh A, Moattari M, Bahreini M. [Effect of reflection on clinical competency of nursing students in Shiraz University.]. *Media* 2011; **4**: 12–18 (in Persian).

Driessen E, Van Tartwijk J, Overeem K, Vermunt J, Van Der Vleuten C. Conditions for successful reflective use of portfolios in undergraduate medical education. *Med. Educ.* 2005; **39**: 1230–1235.

Hespenheide M, Cottingham T, Mueller G. Portfolio use as a tool to demonstrate professional development in advanced nursing practice. *Clin. Nurse Spec.* 2011; **25**: 312–320.

Hrisos S, Illing JC, Burford BC. Portfolio learning for foundation doctors: early feedback on its use in the clinical workplace. *Med. Educ.* 2008; **42**: 214–223.

Iranian Nursing Organization (INO). Competence standards for the registered nurse. 2010 (in Persian).

Johns C. Framing learning through reflection within Carpers' fundamental ways of knowing in nursing. *J. Adv. Nurs.* 1995; **22**: 226–234.

Jones E. A professional practice portfolio for quality learning. *High. Educ. Q.* 2010; **64**: 292–312.

Kear ME, Bear M. Using portfolio evaluation for program outcome assessment. *J. Nurs. Educ.* 2007; **3**: 109–115.

Kolb DA. *Experiential Learning*. London: Prentice Hall, 1984.

Liang L. The gap between evidence and practice. *Health Aff.* 2007; **26**: 119–121.

McColgam K. The value of portfolio building and the registered nurse: a review of the literature. *J. Perioper. Pract.* 2008; **18**: 64–69.

McMullan M. Using portfolios for clinical practice learning and assessment: the pre-registration nursing student's perspective. *Nurs. Educ. Today* 2008; **28**: 873–879.

McMullan M, Endacott R, Gray MA, *et al*. Portfolios and assessment of competence: a review of the literature. *J Adv Nurs* 2003; **41**: 283–294.

Meretoja R, Isoaho H, Leino-kilpi H. Nurse competence scale: development and psychometric testing. *J. Adv. Nurs.* 2004; **47**: 124–133.

Mills J. Professional portfolios and Australian registered nurses' requirements for licensure: developing an essential tool. *Nurs. Health Sci.* 2009; **11**: 206–210.

Patel MX, Doku V, Tennakoon L. Challenges in recruitment of research participants. *Adv Psych Treat* 2003; **9**: 229–238.

Patrick-Williams I, Bennett R. The effectiveness of the professional portfolio in the hiring process of the associate degree nurse. *Teach. Learn. Nurs.* 2010; **5**: 44–48.

Rees C, Sheard C. Undergraduate medical students' views about a reflective portfolio assessment of their communication skills learning. *Med. Educ.* 2004; **38**: 125–128.

Ryan M. Evaluating portfolio use as a tool for assessment and professional development in graduate nursing education. *J. Prof. Nurs.* 2011; **27**: 84–91.

Saltman DC, Tavabie A, Kidd MR. The use of reflective and reasoned portfolios by doctors. *J. Eval. Clin. Pract.* 2010; **18**: 182–185.

Schaffer MA, Nelson P, Litt E. Using portfolios to evaluate achievement of population-based public health nursing competencies in baccalaureate nursing students. *Nurs. Educ. Perspect.* 2005; **26**: 104–112.

Timmins F, Dunne PJ. An exploration of the current use and benefit of nursing student portfolios. *Nurs. Educ. Today* 2009; **29**: 330–341.

Tochel C, Haig A, Kesketh A *et al*. The effectiveness of portfolios for post-graduate assessment and education: BEME guide No 12. *Med. Teach.* 2009; **31**: 299–318.

Trossman S. The professional portfolio: documenting who you are, what you do. *Am. Nurse* 1999; **31**: 1–3.

United Kingdom Central Council for Nursing. *Midwifery and Health Visiting. The PREP Handbook*. London: UKCC, 2001.

Valizadeh S, Rahmani A, Davoudi A, Aminiaee N. Comparison of the effect of clinical education and assessment using portfolio and blended methods on cognitive learning of nursing students in clinical settings. *Iran. J. Med. Educ.* 2011; **11**: 253–245 (in Persian).

Williams GA, Park JR, Traynor V *et al*. Lecturers' and students' perceptions of portfolios in an English school of nursing. *J. Clin. Nurs.* 2008; **18**: 1113–1122.

Yanhua C, Watson R. A review of clinical competence assessment in nursing. *Nurs. Educ. Today* 2011; **31**: 832–836.